Exemption No. 7656

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
RENTON, WASHINGTON 98055-4056

In the matter of the petition of

Schwartz Engineering Company

for an exemption from § 25.813(e) of Title 14, Code of Federal Regulations

Regulatory Docket No. FAA-2001-9780

DENIAL OF EXEMPTION

By letters dated May 12, 2001, and May 22, 2001, Mr. Peter A. Schwartz, Jr., President of Schwartz Engineering Co., 115 Kestrel Drive, Spring Branch, Texas 78070, petitioned for an exemption from the requirements of § 25.813(e) of Title 14, Code of Federal Regulations (14 CFR). The petitioner has requested the exemption in order to permit the installation of interior "hinged/slab" doors between passenger compartments on one private-use Boeing Model 737-700 IGW airplane.

Sections of the FAR affected:

Section 25.813(e) prohibits the installation of doors between passenger compartments.

The petitioner's supportive information is as follows:

"BACKGROUND
"The Certification Basis for the Boeing Model 737-700 IGW is FAR Part 25 with Amendments 25-1 thru 25-77 and Exemption Numbers 6820 and 6820A. The exemptions state in pertinent part that airplanes configured specifically for 'private, not-for-hire, use' are granted exemption to FAR 25.813(e) for the installation of interior doors between passenger compartments. FAR 25.813 (e) states that 'no doors may be installed in any partition between passenger compartments' and 25.813 (f) states that 'if it is necessary to pass through a doorway separating the passenger cabin from other areas to reach any

required emergency exit from a passenger seat, the door must have a means to latch it in the open position'. In addition to 25.813, FAR 25.807 states that 'for a passenger seating configuration of 10 to 19 seats, there must be at least one Type III or larger exit in each side of the fuselage'.

"DISCUSSION
"CFR Part 25 of the Federal Aviation Regulations governs design certification of Transport Category aircraft. The primary intent of these regulations, as written, are to be certain that Aircraft Manufacturers provide for the appropriate design features in their respective aircraft to meet the standards necessary to protect the traveling public. Clearly, there is a requirement 'in the public interest' and in the interest of safety to provide regulatory guidelines for certification. However, it is also very clear these regulations are intended to regulate the certification of 'commercial' aircraft, which are 'for hire' to the general public.

"While the greatest majority of these regulations represent a common sense inclusion for any aircraft regardless of it's intended use, a few are obviously intended to regulate situations that are specific to an airline, or for hire operation. When a Transport Category aircraft is operated under CFR Part 91 and 91.501 and/or CFR Part 125, some of the FAR 25 rules have acceptance criteria that are inappropriate, or are not compatible with this type of operation and the intended use of the aircraft.

"The FAA clearly recognizes these differences as evidenced by the issuance of Exemption Numbers 6820 and 6820A, which eliminated many of the more onerous regulations when applied to 'private use, not-for-hire' operations under CFR Part 91 or CFR Part 125.

"PETITION
"We respectfully request the FAA to issue an additional Exemption for the subject aircraft to FAR 25.813 (e), which prohibits the installation of doors between passenger compartments, to allow for the installation of a 'hinged' type door.

"This Exemption is required to accommodate the owner-specified custom interior installation. Due to space and aesthetic limitations, the particular interior that is intended for installation in this aircraft must have a hinged type door rather than the 'pocket door' that is specified in the existing exemptions.

"BASIS FOR EXEMPTION
"The aircraft that is the subject of this petition is a new 737-700 IGW which was delivered 'green' from Boeing in December of 2000 to the Owner-selected completion facility, Jet Aviation in Basel, Switzerland. It is a privately owned aircraft being completed with a corporate executive type interior.

"The seating configuration as being installed in the subject aircraft provides for occupiable passenger seats for fourteen (14) passengers (see attached floor plan layout), and a crew of four (4). This represents only 9.4% of the capacity allowed for this aircraft. There is no intent now, or in the foreseeable future, to change the interior configuration on the aircraft as being installed.

"Of the fourteen passenger seats that are to be occupied for Taxi, Takeoff, and Landing (TT&L), twelve are located in the central portion of the aircraft between FS 489.5 and 727B + 13.5, in the dining and lounge areas. The other two seats are located aft of the proposed door at FS 786 and FS 874. It is not required that these two passengers utilize the proposed door, located at FS 727B + 13.5, to reach a required emergency exit except in the unlikely event of an emergency landing on water.

"We concur with the FAA's decision to include FAR Part 25.813(e) in Exemption Numbers 6820 and 6820A for 'Special Use, not-for-hire' aircraft. However, due to the caveat that the doors must be transverse acting, we believe that they did not go far enough to allow appropriate flexibility in the design of custom aircraft.

"Other factors to take into account:

"1. The door design contemplated incorporates all features that are required by Exemptions 6820 and 6820A except for being oriented in the transverse direction. It has dual latches (the installation of each one has been analyzed to be able to withstand the required forces of FAR 25.561) to secure it in the open position, cockpit annunciation has been included, and the door design is such that it is frangible in the event that it should become stuck in the closed position and was required for access to the forward exits.

"2. As shown in the attached floor plan, the center area of the aircraft, which would be impacted if this exemption were not to be granted, contains seating for a total of only twelve passengers and it has two Type III Exits. This eliminates any requirement for these people to pass through the proposed door to reach a required exit.

"3. The two passengers that are aft of the door, are able to utilize the aft two service doors in the event of an emergency landing with the exception that in the event of an emergency landing on water, the aft two exits would be unusable due to the flotation characteristics of the aircraft.

"4. The standard pilot compartment door is a hinged door that is frangible. The pilot compartment is typically certified for two crew members and one or more observers. If the hinged door is adequate for four people then it should be satisfactory for two.

"5. The hinged door, when locked open, experiences primarily an in plane loading during an emergency landing. The door is extremely stiff in this plane and the attachments (including the hinges) are far less likely to fail than for a 'pocket' type door which is loaded out of plane.

"6. Due to its orientation and the complexity of the bulkhead within which it is installed, a `pocket' door is more likely to become jammed in the partially open position than a hinged door, thus blocking access to the exits.

"7. The 'frangible' feature most commonly installed in a door is a pivoting panel. This panel is in all respects just like a hinged door which means that ultimately, the final safety feature depended on in the pocket door design is really a hinged door.

"8. It has been acknowledged by the FAA, with caveats, that the passengers on this type of aircraft are typically the same people on most trips. This is especially true in this case where the two seats in question are located in the principal's private bedroom and office quarters. Familiarity with the aircraft layout and operation goes a long way towards providing a level of safety that is equivalent to that which would obtain absent the door.

"9. It is our opinion that the installation of this door between passenger compartments, with all of the attendant safeguards and considering the total number of passengers involved, will provide at least an equivalent level of safety to that which would be provided by the installation of a 'Pocket' type door that is fully compliant with Exemptions 6820 and 6820A.

"IN THE PUBLIC INTEREST -The approval of this Petition for Exemption would demonstrate the FAA's willingness to deal with the issues involved with this Exemption, and would be in the Public Interest for the following reasons:

"1. There is no degradation of safety involved with this request and therefore no detrimental impact to the public at large; and

"2. Given the proliferation of Executive Configured Transport Category Aircraft currently taking place, and anticipated in the near future, this type of exemption will enable US manufacturers of transport category aircraft greater flexibility to effectively compete in this expanding market; and

"3. Additional sales of US manufactured transport aircraft outside the traditional airline market can only serve to increase profitability of US airframe manufacturers, giving greater job stability to the workers employed by those manufacturers; and

"4. Greater stability of a work force as significant as the US aircraft manufacturers represent can only result in additional fuel to stabilize the economy of the US due to the normal household activity associated with stable workers; and

"5. Stability and improved financial performance of the US airframe manufacturers translates into increased orders and stability in numerous other supporting manufacturing organizations; and

"6. Increased sales of these executive configured transport aircraft will ultimately result in some portion of those aircraft being completed at US owned or operated Aircraft

Completion Facilities, providing improved financial performance and work force stability for those organizations as well; and

"7. Improved financial performance of US owned or operated corporations, and increased work force stability translates into continued and improved tax revenues for all governmental organizations involved; and

"8. Improved financial performance allows US corporations to continue to invest in new R & D research which will allow the US to maintain or improve it's competitive position in the world economy; and

"9. A large number of these types of sales can be predicted to be to 'offshore' clients, improving the US Balance of Trade Deficit significantly.

"ADDITIONAL INFORMATION

"1) Rules are written to address a problem. Doors between passenger compartments have been, and would be, a problem on aircraft designed for transporting the traveling public for hire. We are not aware of a single instance on private use aircraft where an interior door was the cause of, or contributory to, a death or personal injury. This is indicative of there being no problem to address.

"2) The proposed hinged door restraints are designed in such a manner that they can be analytically shown to be able to withstand all FAR mandated load conditions, as well as any anticipated aircraft deflections, that might result from a 'survivable' emergency landing. Both the door hinges and the redundant latches attach the door to the office bulkhead which is part of the supporting structure for the 'Murphy' bed. As may be seen in the attached drawings, the proposed installation is very robust.

"3) The Gulfstream series aircraft hold an exemption to this rule as part of their certification basis. They have only two Type III and one Type I emergency exits for the same number of passengers as our aircraft. Due to the relatively small diameter of the Gulfstream fuselage, compartmentalization is only possible by installing bulkheads that span the entire width of the fuselage. When, as has happened many times, a bulkhead containing a door is installed aft of the over-wing exits, passengers that may be seated aft of the bulkhead have no means of escape except through the door. In the case of N349BA (BCJ-2), there are only two passengers seated aft of the door and there are two Type I doors available for their use - without having to pass through the subject door.

"4) In the unlikely event that the door were to be closed during an emergency landing, the width of the door (31 inches) allows for a large frangible panel to facilitate an escape in the forward direction (also in the aft direction).

"5) The hinged door installation will have multiple redundancies:

"a) Dual latches.

"b) Cockpit annunciation.

"c) Frangible panel.

"d) Pre-flight instruction by crew.

"e) Emergency exits on both sides of the door.

"6) If dual latches are sufficient on galleys, why are they not sufficient for the door? Galley carts typically weigh 250 lb. If one were to come loose during a nine 'g' event, the results would likely be far more catastrophic than for the far less likely failure of a properly installed hinged door.

"7) No technical arguments have been advanced by the FAA staff in support of their opposition to the 'hinged' (or 'slab') door. The desirability of the hinged door to those affected by this ruling is so great and, with all of the redundancies, the likelihood of failure is so small, that a technical justification is required. This decision cannot rest on a personal preference to 'not have doors in aircraft interiors.'"

Notice and public procedure provided:

On July 3, 2001, the FAA published notice of the petition for exemption in the Federal Register (66 FR 35316) and requested comments from the public. One comment in support of the petition was received in response to the notice.

The FAA's analysis/summary is as follows:

The safety concerns regarding doors that were the target of the regulation, (namely, the potential to obstruct access to emergency exits as well as create a potential for lack of recognition of exits beyond the door) apply to other types of doors as well. In fact, the current regulations do allow the installation of interior doors, provided passengers are not seated on both sides of the door during takeoff and landing. The FAA is concerned that doors not be located between passengers and exits, and has proposed to prohibit such installations in future designs, as detailed in Notice of Proposed Rulemaking 96-9 (61 FR 38551, July 24, 1996).

Clearly, since the regulations currently allow the installation of some doors under these provisions, those doors that are allowed are considered acceptable. Jamming of doors, however, is not limited to doors that have been properly positioned. Neither is the potential for the door to jam before it can be properly positioned (due to mechanical failure, for example). The doors envisioned by the current regulations are more limited, more likely to be under direct crewmember control, and thus not as subject to these concerns.

With respect to the integrity of the means used to latch doors open for takeoff and landing, the FAA considers that redundant means are necessary, as proposed. Each latching means should have the capability of retaining the door in the takeoff and landing position under the inertia forces of § 25.561. In addition, the FAA believes that the door must be frangible, in the event that it is closed, or closes, during an emergency landing. Frangibility may be demonstrated in accordance with the criteria set forth in FAA Advisory Circular 25-17, "Transport Airplane Cabin Interiors Crashworthiness Handbook," paragraph 43b(2). The applicant's proposed limitations are currently required by Exemptions 6820 and 6820A and therefore do not present any further mitigating features for a hinged door which translates laterally across the aisle between passenger compartments.

As stated in the previous Exemptions 6820 and 6820A, the FAA has concluded that the installation of interior doors that span the main cabin aisle can only be allowed with certain limitations. In order to maximize the level of safety, the FAA will require that the doors installed across the main cabin aisle open and close in a transverse direction. That is, the direction of motion of the door must be at a right angle to the longitudinal axis of the airplane. A "pocket door" is one example of such a design. This will tend to minimize the chance that the inertia forces of an accident could force the door closed. The FAA will also require that notification of the existence of the doors be provided to passengers who are flying on the aircraft for the first time. In addition, the doors must be frangible, they must have a dual retention means, and a means to notify the flightcrew when the door is closed must be provided. This will assure an adequate level of safety for occupants in private aircraft operations.

The concern about the difference between hinged doors and pocket doors is not that the hinges will fail, but that the inertia loads on a hinged door are such that they will tend to force the door into the closed position during a high g-load event. Since it is difficult to predict the deformation of the aircraft cabin in such an event, including deformation of bulkheads and monuments, there is no way to ensure, under dynamic conditions or higher than designed for static conditions, that the latches proposed would prevent a hinged door from swinging closed. With a transverse mounted laterally translating "pocket" door, however, the inertia loads during a high g-load event act perpendicular to the plane of the door; therefore the forces will not tend to force the door into the closed position. Secondly, the frangibility requirements are intended to address a situation in which the door may become jammed during normal use. Since the proper position for the door during taxi takeoff and landing is open, the frangibility feature is not intended to specifically address a high g-load event.

In response to the applicant's statement in paragraph 1 under "Additional Information", the rules are not always written, as stated by the applicant, to address a "problem." Rather, rules are intended to establish a minimum level of safety, taking into

consideration multiple possible failure modes, which will provide a safe environment for the passengers and crew.

In consideration of the foregoing, I find that a grant of exemption from the requirements of § 25.813(e) and Exemptions 6820 and 6820A is not in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. 40113 and 44701, delegated to me by the Administrator , the petition of Schwartz Engineering Company for exemption from compliance with § 25.813(e) and Exemptions 6820 and 6820A is denied.

Issued in Renton, Washington, on November 2, 2001.

/s/ Ali Bahrami
Ali Bahrami
Acting Manager
Transport Airplane Directorate
Aircraft Certification Service, ANM-100